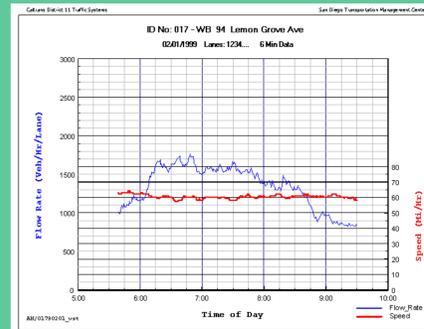
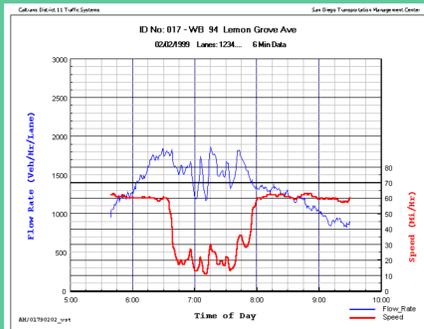


Thomas Aristide | Civil Engineering | San Diego City College | taristide@mac.com  
 Nicholas Thorpe | Electrical Engineering | San Diego State University | nickthorpe84@yahoo.com

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## INTRODUCTION

The mission of California's Department of Transportation (Caltrans) is to improve mobility across the state. Caltrans aims to accomplish their mission in all 12 districts through five strategic goals: safety, mobility, delivery, stewardship and service. Ramp Metering is a low cost way to improve traffic flow on freeways. The meter allows traffic to enter the freeway at rate dependent on the conditions of the freeway traffic. Motorists are often delayed at the meter, but freeway speeds and overall travel times are improved.



**- WHY WE METER THE FREEWAYS -**  
 Caltrans meters westbound SR-94 where it connects with SR-125. The graph on the left shows the speeds and volumes recorded on Feb. 1, 1999 on westbound SR-94 at Lemon Grove Ave. Notice that the speeds are uniform at approximately 60 miles per hour. That is typical for that location during the morning commute period with ramp metering. On February 2nd, 1999 the meter from westbound SR-94 at SR-125 was not functioning. The graph on the right shows the traffic volumes and speeds for that morning. Without the meter functioning, speeds slowed to below 30 miles per hour for 1.15 hrs.

## METHODS

### Within the Traffic Management Center (TMC)

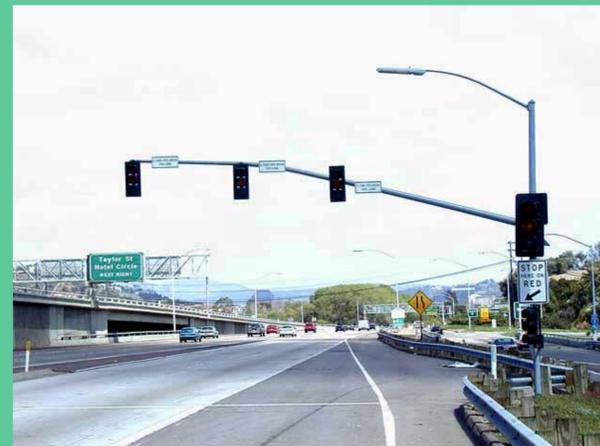
- The Ramp Metering Branch uses the RMI (Ramp Metering Information) and URM (Universal Ramp Metering) Systems for setting, controlling and optimizing ramp meters to increase traffic flow and decrease congestion on freeways.
- The Caltrans Freeway Performance Measurement System (PeMS) receives and archives data from RMIS and URMS for more detailed traffic data analysis.

### In the field –

- Surveillance of ramp performance.
- Delivery and implementation of new controllers.
- Collaboration with Caltrans Maintenance and Construction divisions on current and future



The twelve Caltrans districts and their counties.



Three lane over-head signal standard for ramp metering.

## RESULTS

### Ramp Metering –

- Analyzing historic data from RMIS to maximize ramp metering efficiency provides support to the Ramp Metering Branch for improving traffic flow and reducing the congestion of San Diego freeways.
- Maintenance and use of Controller Test Rack equipment allows for accurate and functional metering parameters of the RMI and URM systems to be deployed to field equipment.
- Using PeMS enables detailed analysis of congested corridors to focus resources and development traffic metering response plans of action.



Nick working on the 170 controller test rack.



Typical metering of a ramp with both SOV and HOV lanes.

## CONCLUSION

Our experience through our internship has given us insight to the industry of our studies that we would not otherwise be exposed to in our academic setting.

By working with the Ramp Metering Branch, Nicholas Thorpe learned about Caltrans' commitment to implementing effective ramp metering strategies to keep freeways operating at their optimum flow rates. Through the process of managing freeway flow through ramp metering, Thomas Aristide gained both the skills and realization that the collection of accurate data is the cornerstone for improving the performance of a managed system.

This internship has helped us acquire skills that are beneficial for our future engineering careers.



San Diego district 11 Traffic Management Center (TMC)



Typical three light ramp meter signal.



Thomas being familiarized with field elements on Coronado Bay Bridge.

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